

Application No. 10/528,362  
Amendment dated February 28, 2008  
Reply to Office Action of November 28, 2007

Docket No.: 4379-0176PUS1

### REMARKS

Claims 1-3 and 6-11 are currently pending. Claims 7-11 are withdrawn due to a restriction requirement. Claim 1 is currently amended. Claims 4 and 5 are canceled. Reconsideration and allowance of all of the pending claims is respectfully requested.

New matter is not being added to the application by way of this amendment. The amendment to claim 1 is supported by original claims 4 and 5. Accordingly, no new matter is added and entry of this amendment is respectfully requested.

#### **Claim Rejections – 35 U.S.C. §103(a)**

Claims 1–3 are rejected under 35 U.S.C. §103(a) as being unpatentable over Tahara '147 (U.S. 4,975,147). Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Tahara '147 in view of Imai '542 (U.S. 6,631,542). Claim 5 is rejected as being unpatentable over Tahara '147 in view of Imai '542, and further in view of Kokubu '761 (JP62-270761) and Kitano '214 (JP2000-087214). Claim 6 is rejected as being unpatentable over Tahara '147 in view of Imai '542, Kokubu '761, and Kitano '214, and further in view of Dawes '316 (U.S. 4,904,316). Applicants respectfully traverse each of these rejections for the following reasons.

#### *1. Claim 1*

In order to establish a case of *prima facie* obviousness, the Examiner must articulate "a finding that the prior art included each element claimed." MPEP §2143. Applicants respectfully submit that the prior art does not disclose replacing the nitriding gas atmosphere during nitride treatment, and using both a first mixed gas and a second mixed gas as recited in claim 1. Accordingly, a *prima facie* case of obviousness is not established, and applicants submit that each of the pending prior art rejections must be withdrawn.

As the Examiner mentions in the Office Action, Tahara '147 in view of Imai '542 does not disclose changing the nitriding gas atmosphere during nitride treatment using both a first mixed gas and a second mixed gas for nitriding treatment for a specified time as presently claimed. See Office Action, page 6, lines 1-7. The Examiner cites Kokubu '761 for the disclosure

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of a first mixed gas and changing the nitriding gas atmosphere. Further, the Examiner cites Kitano '214 for the disclosure of a second mixed gas.

However, applicants respectfully submit that the cited references in combination do not disclose or suggest a method of nitriding performed by replacing a first mixed gas with a second mixed gas when one-third to one-half of the processing time has elapsed as presently claimed. In particular, applicants note that Kokubu '761 also does not disclose or suggest changing the nitriding gas atmosphere at a predetermined time as presently claimed.

Further, applicants respectfully submit that even if a *prima facie* case of obviousness were to be established, the present invention demonstrates unexpected results over the prior art, which fully rebut any assertion of obviousness as described below.

If the atmosphere inside the heating furnace is replaced by a second mixed gas before at least one-third of the processing time elapses, the formation of the nitrided layer becomes insufficient and the desired hardness will not be obtained on the surface of the metal ring. Also, if the replacement is carried out when more than one half of the processing time has passed, the nitrided layer is excessively formed on the metal ring and a sufficient toughness is not obtained. See the present specification at page 11, line 21 to page 12, line 2.

By using both a first mixed gas and a second mixed gas for nitriding treatment, and by replacing at the presently claimed predetermined time, the decomposition of the ammonia is promoted by the first mixed gas and a nitrided layer which has excellent toughness, as well as excellent hardness is formed by the second mixed gas. See the present specification at page 10, lines 1-13, to page 11, lines 11-20. Applicants therefore respectfully submit that the present invention demonstrates unexpected results in toughness as well as hardness. Accordingly, any hypothetical case of *prima facie* obviousness is fully rebutted, and applicants respectfully submit that claim 1 is allowable.

## 2. Claims 2, 3, and 6

Claims 2, 3, and 6 are each dependent upon independent claim 1. Applicants respectfully submit that claim 1 is demonstrated as patentable as described above. The additional art cited by the Examiner, Kokubu '761, Kitano '214, and Dawes '316, does not make up for the deficiencies

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described above for claim 1. Accordingly, applicants respectfully submit that claims 2, 3, and 6 are patentable as well. An early reconsideration and Notice of Allowance are respectfully requested.

Conclusion

In view of the above remarks, it is believed that claims are allowable.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Mark Konieczny, Reg. No. 47,715 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: February 28, 2008

Respectfully submitted,

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